

REMARKS

The withdrawn claims 2-7 have been cancelled. Claim 35 has been amended by incorporating therein the subject matter of former claim 36, thus specifying that, in step (a) the reagent attaches to the titania particle via a covalent bond. Claim 36 has been cancelled as redundant over amended claim 35 and a consequential change has been made in the dependency of claim 37.

No new matter is introduced by any of the foregoing amendments.

Claims 1, 8-20, 35 and 37-42 are present in this application and all claims stand rejected. Claims 35 and 39-40 stand rejected under 35 USC 102(b) as anticipated by Herman et al., U.S. Patent No. 3,884,871. This rejection is traversed. More specifically, this rejection is traversed on the grounds that Herman does not disclose a process in which a reagent is bonded to a titania particle via a covalent bond, as required by all of claims 35 and 39-40.

Herman (in so far as relevant for present purposes) describes a process for the coating of titania pigment particles, in which there is added to a water slurry of titania a polyanionic dispersing agent, the slurry is diluted until it contains 15 to 30% of titania, and then there is added to the diluted slurry an anchoring agent comprising an organic vinyl monomer *containing polar groups which are adsorbed on to the surface of said [titania] particles* (see Herman claim 1, emphasis added). The italicized wording clearly shows that in the Herman process the "anchoring agent" is simply adsorbed on to the titania surface by ionic interactions and is not bonded to the surface via a covalent bond, as required by present claims 35 and 39-40. Hence, Herman cannot anticipate any of the present claims.

It should be noted that this distinction between the present claims and Herman is not merely a matter of design choice. Herman's titania is intended for use in paints, especially latex paints and plastics. In such media, and especially in aqueous latex paints, there is little tendency for a polymer coating formed on the titania particle to become detached from the particle. In contrast, the coated titania particles of the present

invention are intended for use in electrophoretic media, which typically use organic suspending fluids (see, for example, Examples 26 and 27 of the present application). In such media, there is a much greater risk of a polymer held on to the titania particle only by adsorption becoming detached from the particle (cf. Paragraph 13 of the present application) with undesirable consequences.

Claims 35 and 37-42 stand rejected under 35 USC 103(a) as unpatentable over Katoh et al., U.S. Patent No. 6,514,328, in view of Sakai et al., U.S. Patent 5,750,258. This rejection is traversed. More specifically, this rejection is traversed on the grounds that (a) Katoh describes a wide variety of particles and coatings, and does not contain a clear disclosure of a titania-coated particle as suggested in the Office Action (essentially, the Examiner is taking exactly those parts of Katoh which support the rejection, while ignoring the context of these parts); and (b) there is no logical way to combine Katoh and Sakai.

With regard to point (a), Katoh teaches an unusual type of single particle electrophoretic medium using two mutually immiscible suspending fluids (X and Y in Figures 1A-1C and 2), one of these two fluids (X) containing a dye (A) which is insoluble in the other fluid (Y). The medium further contains solid particles of a pigment (B) which can move between the immiscible suspending fluids. Katoh states that

"when a titanium oxide powder is used as the pigment powder, preferable examples of the material for use in the coating layer 21 are silicon oxide, aluminum oxide, polyethylene, phenolic resin, poly(methyl acrylate), melamine resin, urea resin, Teflon resin, poly(vinylidene fluoride), polyvinyl alcohol, and polyethylene oxide. When a nylon powder is used as the pigment powder 20, preferable examples of the material for use in the coating layer 21 are titanium oxide and aluminum oxide. These materials may be used alone or in combination."(column 17, lines 4-14).

Katoh subsequently states that in his Figure 4C, a layer is provided on the surface of a pigment powder 20 [the material forming this powder is not specified] by covalent

bonding, and that the affinity of a dye solution or dye for the pigment powder 20 can be adjusted by selecting ions of a chemically adsorbed material (A-B) 22, and properties of the side chain or end group of the material 22. Katoh further states that the above-mentioned chemical adsorption can be attained by titanium coupling, silane coupling, aluminum coupling, or graft polymerization, and that the pigment powder may be previously subjected to any of the above-mentioned treatments, or a reaction reagent may be added to the dispersion media in advance. Katoh then proceeds to recite numerous specific reagents which may be used in titanium coupling, silane coupling, and aluminum coupling.

In other words, Katoh teaches numerous coatings specifically intended for titania, none of which meet the requirements of any of the present claims, and numerous reagents which may be used to produce coatings on (unspecified) pigment particles.

With regard to point (b), the Office Action admits that Katoh fails to teach that a polymer coating is formed on the surface by copolymerization of a monomer with a polymerizable group of the silane coupling agent, but notes that Sakai teaches that a polymer layer can be covalently bonded on the surface by copolymerization of a monomer with a polymerizable group of the silane coupling agent, and concludes that it would have been obvious to one of ordinary skill in the art to form a polymer layer 21 in Katoh by copolymerization of a monomer with a polymerizable group of the silane coupling as described by Sakai.

There is no logical way to combine Katoh and Sakai. As noted in the previous amendment, Sakai is explicitly restricted to silica particles, which are shown to have the right physical properties for use as spacers in liquid crystal displays. There is no logical reason why a skilled person, seeking to improve the Katoh coated titania particles, would assume that Sakai is relevant. Sakai is concerned solely with controlling the surface properties of silica particles to render them more suitable for use as spacers in liquid crystal displays, whereas Katoh is concerned with coating titania particles to adjust their relative affinities for two immiscible suspending fluids (typically water and

hydrocarbon) in an electrophoretic display. (The reference to liquid crystals in Katoh is solely by way of acknowledging prior art in the area of electro-optic displays; the Katoh displays are electrophoretic displays, not liquid crystal ones, and there is no suggestion in Katoh that liquid crystals can usefully be used as either of his suspending fluids.) Given the major differences in both the materials being coated and the liquid in which the coated particle is to be used, there is no logical reason why the skilled person would assume that the type of coating described in Sakai would be useful in the Katoh displays.

For the foregoing reasons, the 35 USC 103 rejection is unjustified and should be withdrawn.

Applicants note that, as set out in Paragraphs 11-13 of the Office Action, the Examiner is maintaining certain 35 USC 103 rejections set out in the Office Action. Applicants consider that the disagreement between the Examiner and the applicants as to the allowability of the rejected claims can only be resolved by the BPAI, and accordingly a Notice of Appeal is filed herewith.

Entry of this Amendment After Final Rejection is respectfully requested on the grounds that it will not require extensive consideration by the Examiner, being confined to responses to certain 35 USC 102 and 103 rejections to which applicants have had no previous chance to respond, but that it will substantially simplify the issues for appeal.

This application now contains 21 claims, including two independent claims. Since applicants have already paid fees for 29 claims, including four independent claims, no additional claim fees are required in connection with this Amendment.

Honeyman et al.
Serial No. 10/711,278
Amendment After Final Rejection, February 22, 2006
Page 10

Since the normal period for responding to the Office Action expired January 31, a Petition for a one month extension of this period is being filed herewith.

Respectfully submitted



David J. Cole
Registration No. 29629

E INK Corporation
733 Concord Avenue
Cambridge MA 02138

Telephone (617) 499-6069
Fax (617) 499-6200
E-mail dcole@eink.com